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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,950	11/18/2003	John Laurence Melanson	1067-CA-C1 (P108C1)	4450

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EXAMINER
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D AGOSTA, STEPHEN M

ART UNIT	PAPER NUMBER
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2683

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/715,950	Applicant(s) MELANSON, JOHN LAURENCE	
	Examiner Stephen M. D'Agosta	Art Unit 2683	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2005.  
2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 26-31 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 3-8 and 26-29 is/are rejected.  
7) ☒ Claim(s) 30 and 31 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 4-6-05 have been fully considered but they are not persuasive.

1. The applicant argues that Hoyt is not a proper USC 102 rejection and fails to teaches "pulse width modulation circuitry...in response to a change in the divide ratio". The primary examiner notes that the applicant then focuses on the fact that Hoyt does not teach two clocks. The independent claims do not recite "two separate clocks", but rather only recite two clock signals, which can be generated from one clock source as is well known in the art (eg. Hoyt discloses using a divider):

"...said radio receiver and operating at a selected switching frequency, the audio amplifier including pulse width modulation circuitry operating in response to a clock signal of a selected frequency and another clock signal having a frequency of a selected frequency divide ratio to the frequency of the clock signal..."

Hence the primary examiner has given the claims their broadest interpretation (eg. one clock source that generates two signals).

2. The applicant argues that Hoyt does not explicitly disclose a clock signal input. The primary examiner disagrees since one skilled realizes that digital systems employing PWM inherently use clocks and Hoyt discloses a local oscillator which is interpreted as a clock signal (see C1, L60 to C2, L50).

3. Hoyt teaches a PW-modulated amplifier that uses two clock signals (eg. not clocks) as claimed by the applicant:

"...C2, L50 teaches changing clock frequency of amplifier) in response to a change in said divide ratio (C2, L11-23 and figure 5 shows a DIVIDE-BY-N-CIRCUIT, #220 along with

an AM Local Oscillator #100 and a Reference Clock #110A whereby the divided Local Oscillator is outputted to the Class D amplifier #230) ; and

Circuitry for setting said switching frequency of said switched mode circuitry by setting said divide ratio as a function of a frequency of an AM signal being received by said radio receiver (figure 5 shows the Divided Local Oscillator #230 being a function of the AM Local Oscillator #100 that is fed into the DIVIDE-BY-N Circuit #220 and the logic of #200 which reads on the claim)...”

4. The primary examiner upholds his original rejection. A more favorable outcome may occur should the applicant amend per the examiner's recommendations.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 3, 5-8 and 26-28** rejected under 35 U.S.C. 102(e) as being anticipated by Hoyt et al. US 6,587,670 (hereafter Hoyt).

As per **claims 1 and 27-28**, Hoyt teaches a system comprising:

An AM radio receiver (eg. a class D amplifier for use in an AM radio receiver, (abstract, and C1, L10-57);

Switched mode circuitry comprising an audio amplifier for driving an audio channel of said radio receiver and operating at a selected switching frequency (figure 2

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shows AM/FM switch and modulator/demodulators), the audio amplifier including a system comprising:

Pulse width modulation circuitry (figure 2 shows PWM in class D amplifier block) operating in response to a clock signal of a selected frequency and another clock signal having a frequency of a selected frequency divide ratio to the frequency of the clock signal, the pulse width modulation circuitry outputting a pulse width modulated signal at said selected switching frequency and changing operating characteristics (C1, L60 to C2, L50 teaches changing clock frequency of amplifier) in response to a change in said divide ratio (C2, L11-23 and figure 5 shows a DIVIDE-BY-N-CIRCUIT, #220 along with an AM Local Oscillator #100 and a Reference Clock #110A whereby the divided Local Oscillator is outputted to the Class D amplifier #230) ; and

Circuitry for setting said switching frequency of said switched mode circuitry by setting said divide ratio as a function of a frequency of an AM signal being received by said radio receiver (figure 5 shows the Divided Local Oscillator #230 being a function of the AM Local Oscillator #100 that is fed into the DIVIDE-BY-N Circuit #220 and the logic of #200 which reads on the claim).

As per **claim 3**, Hoyt teaches the system of Claim 1 wherein said switched mode circuitry comprises a Class D amplifier (title).

As per **claim 5**, Hoyt teaches the system of Claim 1 wherein said circuitry for setting said switching frequency of said switched mode circuitry comprises:

a signal generator for generating a base frequency of the clock signal (figure 5, AM Local Oscillator #100 that inputs into #220, Divide-by-N circuit);

a programmable divider for dividing said base frequency by a selected divisor to generate said another clock signal of a frequency with said selected divide ratio to the base frequency of the clock signal (figure 5, #220); and

control circuitry for selecting said divisor (figure 5, #200 is logic/control circuit and also see figure 6, #610).

As per **claim 6**, Hoyt teaches the system of Claim 1 wherein said circuitry for setting said switching frequency includes a microcontroller operable to select said switching frequency in response to selection of a reception frequency band by user input (figure 6 shows a feedback controller, eg. microcontroller, that can modify the switching frequency in response to a reception frequency band selected by the user since the Divide-by-N circuit #610 will be modified depending upon the LO #600 frequency chosen).

As per **claim 7**, Hoyt teaches the system of Claim 1 wherein said circuitry for setting said switching frequency detects said frequency of said signal received by said radio receiver by measuring a local oscillator frequency (figures 6-7 and C2, L51-65 teaches detecting the frequency).

As per **claim 8**, Hoyt teaches the system of Claim 1 wherein said switching frequency is selected such that at least one harmonic of said switching frequency lies outside a frequency band including said signal being received by said radio receiver (C2, L51-65 teaches selecting a frequency such that its harmonic(s) are "far away as possible from the tuned radio station corresponding to the frequency of the local oscillator").

As per **claim 26**, Hoyt teaches the system of Claim 1 wherein said circuitry for setting said switching frequency is operable to set said switching frequency to a selected one of a set of frequency steps differing in frequency by at least two percent (figures 5 and 7 show reference clocks #150/#160/#170 that are fed to the Filter #190 and Logic #200 which can connect to Oscillators A, B or C (#220) which are selected depending up on the frequency of the AM radio tuned to by the user and would inherently vary by more than 2% to accommodate the range of possible AM frequencies, otherwise there would have to be more Oscillators, see C3, L8-35 too).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 4 and 29** rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt.

As per **claim 4**, Hoyt teaches the system of Claim 1 wherein said circuitry for setting said switching frequency of said switched mode circuitry comprises:

control circuitry for selecting said selected one of said crystals to set the frequency of said clock signal (figure 5 #300 shows "LOGIC" which is interpreted as being "control circuitry" for selecting any of the three inputs that come from the FILTER, #190 and Comparators, #140, #141, #142),

**but is silent on**

a plurality of crystals of differing resonance frequencies;

a crystal oscillator for generating said switching frequency from a selected one of said crystals.

Hoyt does teach use of different reference clocks (figure 5, #150, #110A, #160, #170 as well as an AM local Oscillator, #100 in two places) and one skilled can interpret said reference clocks as being "crystals of differing resonance frequencies, a crystal oscillator for generating said switching frequency from a selected one of said crystals" since they both perform the same task (eg. generate a clock frequency).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Hoyt, such that it uses a plurality of crystals of differing resonance frequencies and a crystal oscillator for generating said switching frequency from a selected one of said crystals, to provide means for supporting the entire AM frequency range via the multiple reference clock frequencies.

As per **claim 29**, Hoyt teaches the system of Claim 27, **but is silent on** wherein the pulse width modulation circuitry changes a pulse width of the pulse width modulated signal in response to a change in the divide ratio.

Hoyt does teach PWM which inherently changes the pulse width to modulate a signal. Hoyt also teaches that the width of (just) the low side pulse is roughly proportional to the output voltage and primarily sets the loop frequency (C5, L27-36 which implies that the width changes (as one skilled would expect).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Hoyt, such that the pulse width modulation circuitry changes a pulse width of the pulse width modulated signal in response to a change in the divide ratio, to provide means for supporting multiple AM frequencies that the user may select thus insuring optimal PWM based on frequency.

### ***Allowable Subject Matter***

**Claims 30-31** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

These claims recite novel material, in the examiner's opinion, which is not found in the prior art of record.

30. (New) The system of Claim 27, wherein the pulse width modulation circuitry changes a zero point of a pulse of the pulse width modulated signal in response to a change in the divide ratio.

31. (New) The system of Claim 27, wherein the pulse width modulation circuitry changes varies distortion correction operations in response to a change in the divide ratio.



***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 571-272-7862. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta  
PRIMARY EXAMINER  
4-22-2005

